

Evidence Based Ayurveda- Emerging Concepts

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ABSTRACT

Ayurveda is among traditional systems of medicine existing in India. More than 70% of India's 1.1 billion populations, still use non-allopathic systems of medicine. Drug discovery has definite base on linkage of traditional medicine with ethno pharmacology. Ayurvedic medicine has been truly, defined as reverse pharmacology and this approach have given modern medicine, life saving drugs. Integrative approach between two sciences is need of the hour to combat intractable diseases.

Keywords: Ayurveda; Traditional medicine; Reverse pharmacology; Ethno pharmacology; Drug discovery

INTRODUCTION

A number of traditional systems of medicine exist in India of which Ayurveda is the most popular. Despite being in use for more than 3000 years, few properly designed trials have scientifically examined the clinical potential of Ayurvedic and other medications. Evidence-based studies on the efficacy and safety of traditional Indian medicines are limited. The essential ingredient in most of the formulations is not precisely defined. High quality studies are necessary to evaluate and compare the value of traditional Indian drugs to modern medicine [1].

HERBAL RESEARCH IN INDIA

Herbal drugs constitutes major share of all the officially recognized systems of health in India viz. Ayurveda, Yoga, Unani, Siddha, Homeopathy and Naturopathy, except Allopathy. More than 70% of India's 1.1 billion populations still use these non-allopathic systems of medicine. Evidence-based herbals are widely used in the diverse systems and manufactured, as per the pharmacopoeial guidelines, by a well-organized industry. Significant basic and clinical research has been carried out on the medicinal plants and their formulations, with the state-of-the-art methods in a number of Institutes/Universities. There are some good examples. Indian medicinal plants also provide a rich source for antioxidants that are known to prevent/delay different diseased states. The medicinal plants also contain other beneficial compounds like ingredients for functional foods. Hence, the global knowledge about Ayurveda and Indian herbals will hopefully be enhanced by information on the evidence-base of these plants [2].

LINK BETWEEN TRADITIONAL MEDICINE AND ETHNOPHARMACOLOGY

Evidence-based approaches should readily capture the essence of a well characterized plant or animal extract derived from long years of practice in a particular culture and then subject that well characterized extract to an easily designed model for further rigorous experimentation: *in vitro*; animal models; well defined clinical trials, that are empirical. In a sense, one discipline discovers whereas the other experiments and seeks to provide information through the use of ideally randomized, clinical trials that withstand all the rigors of evidence based approaches. These then are dependent on the discoveries and information transfer provided by the ethno pharmacologists—they discover and CAM puts the discoveries to work [3].

A study reported wide range of clinical and other *in vivo* studies for many of the plant-based therapies utilized in the Ayurvedic system. Of the 166 plants investigated, 72 (43%) had at least one or more human studies and 103 (62%) had one or more animal studies. These results appear to contradict the generally held notion that herbal remedies used in non-Western systems of botanical medicine have not been evaluated in human or *in vivo* trials. Some of these studies are not always as large or methodologically rigorous as clinical studies reported in major medical journals. Indeed, a critical assessment of the research according to the standards of evidence-based medicine would eliminate many of these studies for lack of rigor according to criteria of randomization, sample size, adequacy of controls, etc. However, the studies do suggest which species might be appropriate for larger and better-controlled trials in the future [4].

Table 1. Re-discovery of the paradigm of reverse pharmacology

Medicinal Plant	Clinical Effect	Experimental Correlate
<i>Chondrodendron tomentosum</i>	Paralysis and death	Neuromuscular block
<i>Cinchona officinalis</i>	Fever	Antimalarial
<i>Digitalis purpurea</i>	Dropsy	Na ⁺ -K ⁺ ATPase
<i>Papaver somniferum</i>	Analgesia	Opioid receptors
<i>Physostigma venenosum</i>	Ordeal poison	Anticholinesterase
<i>Salix alba</i>	Fever and pain	Prostaglandins
<i>Strychnos nux-vomica</i>	Stimulant and convulsant	Glycinergic receptors

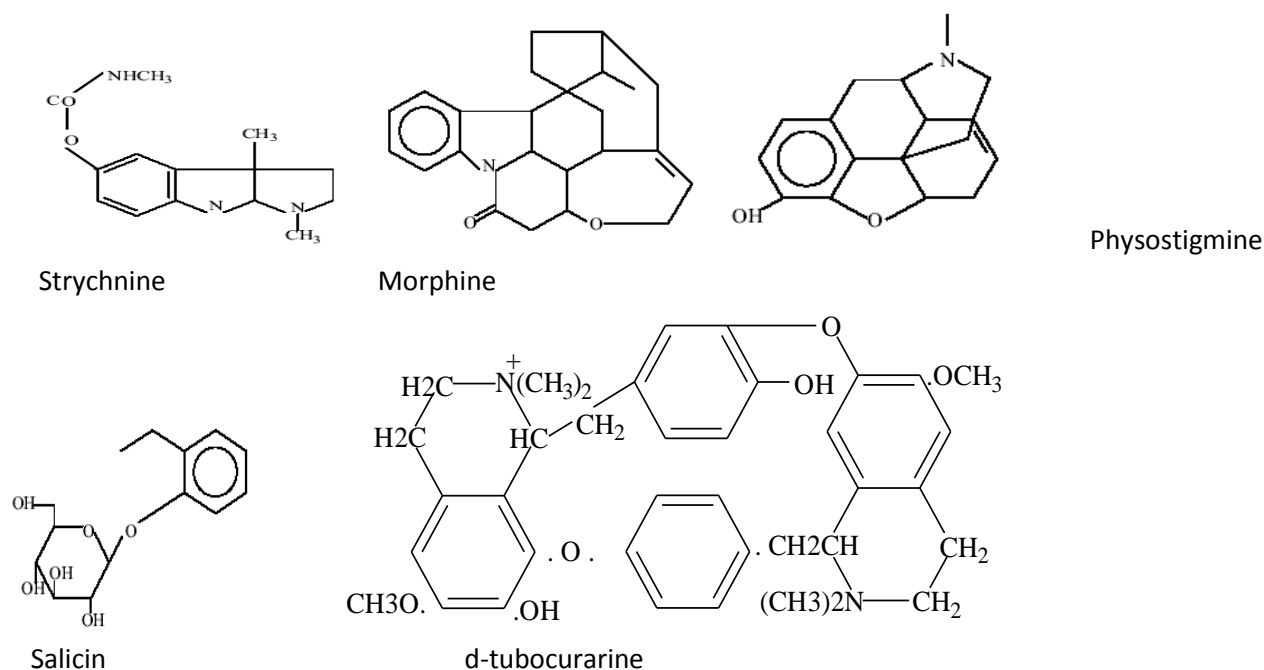


Fig 1: Active constituents of plants listed in table 1

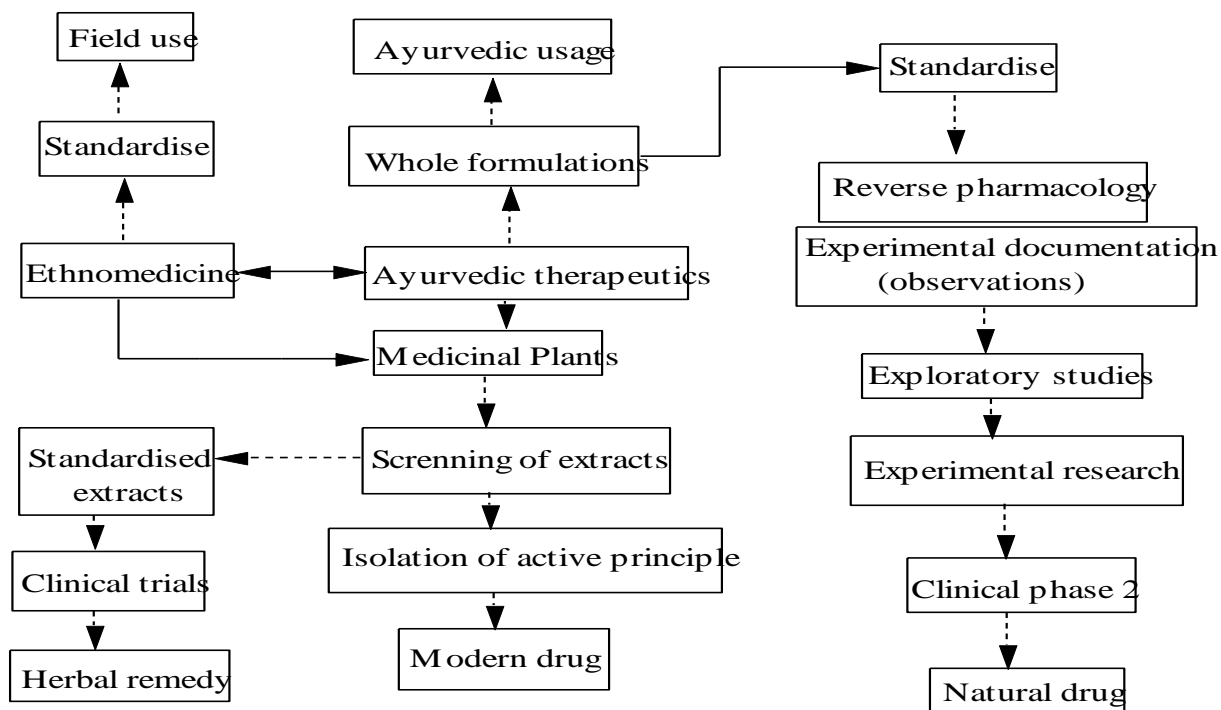


Fig 2: Scheme for drug discovery from plants used in Ayurveda

DRUG DISCOVERY AND AYURVEDA

Ayurvedic system of medicine is living great traditions. These traditions have relatively organized databases, and more exhaustive descriptions of botanical material that are available and can be tested using modern scientific methods. Both systems of medicine thus have an important role in bioprospecting of new medicines. Good botanical practices which can improve the quality control procedures of monitoring impurities, heavy metals and other toxins in the raw material can make the ethno pharmacology research more meaningful [5].

Drug discovery strategies based on natural products and traditional medicines are re-emerging as attractive options. Drug discovery and development need not always be confined to new molecular entities. Rationally designed, carefully standardized, synergistic traditional herbal formulations and botanical drug products with robust scientific evidence can serve as alternatives. A reverse pharmacology approach, inspired by traditional medicine and Ayurveda can offer a smart strategy for new drug candidates to facilitate discovery process and also for the development of rational synergistic botanical formulations [6].

REVERSE PHARMACOLOGY

Reverse pharmacology is the science of integrating documented clinical/experiential hits, into leads by transdisciplinary exploratory studies and further developing these into drug candidates by experimental and clinical research. The scope of reverse pharmacology is to understand the mechanisms of action at multiple levels of biological organization and to optimize safety, efficacy and acceptability of the leads in natural products, based on relevant science [7]. The paradigm of reverse pharmacology is actually a rediscovery of the path, which founded modern pharmacology. Table 1 lists the names of plants, clinical effects, and experimental correlates. The list illustrates how novel clinical bio-dynamic effects can lead to the development of the basic disciplines in pharmacology and biology [1,2, 7].

Reverse pharmacology was only sporadically applied to new drug development. It is need of the time to document unknown, unintended and desirable novel

prophylactic and therapeutic effects in observational therapeutics. Several classes of drugs have accidentally emerged by this path (Fig 1).

Central Council for Research in Ayurveda and Siddha (CCRAS) has recently adopted the golden triangle approach for some new indications of old drugs, as well as for Ayurveda. Golden triangle approach is combination of Dravyagunavignyan, systems biology, and reverse pharmacology for discover of potent and cost-effective remedies.

EMERGING CONCEPTS

Rasayana represents rejuvenate measures to impart biological sustenance to the bodily tissues. These are claimed to act as micronutrients. Some of these Rasayanas are organ and tissue specific. Those specific to brain tissue are called Medhya Rasayana.

Such Rasayanas retard brain aging and help in regeneration of neural tissues besides producing antistress, adaptogenic and memory enhancing effect. In addition to the long tradition of textual and experience-based evidence for their efficacy, certain recent studies conducted on these traditional remedies on scientific parameters have shown promising results [9].

A key part of Ayurveda that has been obscure to modern science is the substance "ojas", which the classical texts say maintains balance of the physiology. Specific steroids or steroid classes are proposed as likely candidates for both the "ordinary" and the "superior" types of ojas described in Ayurveda [10]. Integrative approach between Ayurveda and modern medicine is need of the hour. The recent example of successful treatments of lymphedema using Ayurvedic and Yoga medicine practices together with modern medicine, justifies the integral approach for scientific propagation of traditional medicine [11].

CONCLUSION

From the data cited above, it can be concluded that reverse pharmacological and integrative approaches between traditional and conventional medicine should be implemented. Ayurveda has served the humanity since 300 years but it has not got due. The only way of bringing Ayurveda to scientific front is propagating 'evidence based Ayurveda' rather than 'traditional Ayurveda'.

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